

## **REMARKS**

### **I. Introduction**

Claims 14 to 26 are pending in the present application. In view of the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

### **II. Rejection of Claims 14 and 16 to 19 Under 35 U.S.C. § 103(a)**

Claims 14 and 16 to 19 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of U.S. Patent No. 5,741,396 ("Loewenstein") and U.S. Patent Application Publication No. 2001/0007275 ("Yanagisawa et al."). It is respectfully submitted that the combination of Loewenstein and Yanagisawa et al. does not render unpatentable these claims for at least the following reasons.

Claim 14 relates to a device for generating chlorine trifluoride and recites a plasma reactor, plasma generating means, a first gas, a second gas selected to react with the first gas to form chlorine trifluoride when under the influence of a high-density plasma, gas supply means via which the first gas and the second gas can be supplied to the plasma reactor, these gases reacting with one another under the influence of the high-density plasma *in the plasma reactor*, forming chlorine trifluoride, and a gas outlet via which the *formed chlorine trifluoride can be removed from the plasma reactor*. Thus, the device recited in claim 14 is arranged to form chlorine trifluoride *in the plasma reactor*.

Loewenstein discloses a system arranged to dissociate portions of gases to yield atomic elements plus radicals, and to transport these species to a wafer for etching. See, e.g., col. 3, line 63 to col. 4, line 2 and col. 4, lines 46 to 51. The Office Action asserts at page 3 that "[t]he apparatus of Lowenstein [sic] is considered capable of generating chlorine trifluoride by the plasma activated species of fluorine and chlorine." Even if it is assumed, arguendo, that this assertion is correct, Loewenstein does not disclose or suggest the formation of chlorine trifluoride *in the plasma reactor*. Rather, as indicated above, the excited species are transferred to the wafer. Thus, the formation of the chlorine trifluoride, if any, would occur downstream of the plasma reactor. Yanagisawa et al. does not cure this deficiency.

In view of the foregoing, it is respectfully submitted that the combination of Loewenstein and Yanagisawa et al. does not disclose or suggest all

of the features of claim 14. As such, it is respectfully submitted that the combination of Loewenstein and Yanagisawa et al. does not render unpatentable claim 14.

Claims 16 to 19 depend from claim 14 and therefore include all of the features recited in claim 14. It is therefore respectfully submitted that the combination of Loewenstein and Yanagisawa et al. does not render unpatentable these dependent claims for at least the same reasons set forth above in support of the patentability of claim 14.

Further regarding claim 19, the Office Action states at page 5 that "claim limitation pertaining to generation of gaseous chlorine trifluoride is an intended use limitation, and since the prior art apparatus meets all of the structural limitations of the claim, the same is considered capable of meeting the intended use limitation." Applicants note that this analysis is improper. Firstly, the referenced claim recitation is not an intended use limitation as indicated. Further, functional limitations must be considered. See M.P.E.P. 2173.05(g) ("A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.").

Withdrawal of this rejection is therefore respectfully requested.

### **III. Rejection of Claim 15 Under 35 U.S.C. § 103(a)**

Claim 15 was rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Loewenstein, Yanagisawa et al., and U.S. Patent No. 5,756,400 ("Ye et al."). It is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., and Ye et al. does not render unpatentable claim 15 for at least the following reasons.

Claim 15 depends from claim 14 and therefore includes all of the features recited in claim 14. As indicated above, the combination of Loewenstein and Yanagisawa et al. does not disclose or suggest all of the features recited in claim 14. Ye et al. is not relied upon as disclosing the features of claim 14 not disclosed or suggested by the combination of Loewenstein and Yanagisawa et al. Indeed, Ye et al. does not disclose, or even suggest, the features of claim 14 not disclosed or suggested by the combination of Loewenstein and Yanagisawa et al.

As indicated above, the combination of Loewenstein, Yanagisawa et al., and Ye et al. does not disclose or suggest all of the features of claim 15. As such, it is respectfully submitted that the combination of Loewenstein, Yanagisawa et

al. and Ye et al. does not render unpatentable claim 15. Accordingly, withdrawal of this rejection is respectfully requested.

#### **IV. Rejection of Claims 20 and 22 Under 35 U.S.C. § 103(a)**

Claims 20 and 22 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Loewenstein, Yanagisawa et al., and "Highly Selective Etching of Si<sub>3</sub>N<sub>4</sub> to SiO<sub>2</sub> Employing Fluorine and Chlorine Atoms Generated by Microwave Discharge" ("Suto et al."). It is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., and Suto et al. does not render unpatentable any of these claims for at least the following reasons.

Claim 20 relates to a method for generating chlorine trifluoride. Claim 20 recites the steps of generating a high-density plasma in a plasma reactor, and supplying to the plasma reactor a first gas and a second gas, which react with one another under the influence of the high-density plasma in the plasma reactor, forming chlorine trifluoride.

Loewenstein discloses a plasma that dissociates portions of gases to yield atomic elements plus radicals, and transporting these species to a wafer for etching. See, e.g., col. 3, line 63 to col. 4, line 2 and col. 4, lines 46 to 51. The Office Action asserts at page 7 that "the prior art method would inherently produce chlorine trifluoride since Loewenstein also teaches that instead of supplying first and second gas, ClF<sub>3</sub> could be directly used." As an initial matter, Applicants respectfully traverse this and all other assertions of inherency contained in the Office Action, as the Office Action does not provide a "basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied art." (See M.P.E.P. § 2112; emphasis in original; and see Ex parte Levy, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int'f. 1990)). Further, even if it is assumed, arguendo, that this assertion is correct, as indicated above in support of the patentability of claim 14, Loewenstein does not disclose or suggest the formation of chlorine trifluoride in the plasma reactor. Rather, as indicated above, the excited species are transferred to the wafer. Thus, the formation of the chlorine trifluoride, if any, would occur downstream of the plasma reactor. Yanagisawa et al. and/or Suto et al. do not cure this deficiency.

As indicated above, the combination of Loewenstein, Yanagisawa et al., and Suto et al. does not disclose or suggest all of the features of claim 20. As such, it is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., and Suto et al. does not render unpatentable claim 20.

As for claim 22, which depends from claim 20 and therefore includes all of the features recited in claim 20, it is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., and Suto et al. does not render unpatentable claim 22 for at least the same reasons set forth above in support of the patentability of claim 20.

In view of the foregoing, withdrawal of this rejection is respectfully requested.

**V. Rejection of Claims 21 and 25 Under 35 U.S.C. § 103(a)**

Claims 21 and 25 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Loewenstein, Yanagisawa et al., Suto et al., and Ye et al. It is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., Suto et al., and Ye et al. does not render unpatentable claims 21 and 25 for at least the following reasons.

Claim 21 and 25 depend from claim 20 and therefore include all of the features recited in claim 20. As more fully set forth above, the combination of Loewenstein, Yanagisawa et al., and Suto et al. does not disclose, or even suggest, all of the features recited in claim 20. Ye et al. is not relied upon for disclosing or suggesting the features of claim 20 not disclosed or suggested by the combination of Loewenstein, Yanagisawa et al., and Suto et al. Indeed, Ye et al. does not disclose, or even suggest, the features of claim 20 not disclosed or suggested by the combination of Loewenstein, Yanagisawa et al., and Suto et al.

In view of the foregoing, it is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., Suto et al., and Ye et al. does not render unpatentable claims 21 and 25. Accordingly, withdrawal of the present rejection is respectfully requested.

**VI. Rejection of Claims 23 and 26 Under 35 U.S.C. § 103(a)**

Claims 23 and 26 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Loewenstein, Yanagisawa et al., Suto et al.

and U.S. Patent No. 6,136,214 ("Mori et al."). It is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., Suto et al., and Mori et al. does not render unpatentable claims 23 and 26 for at least the following reasons.

Claims 23 and 26 depend from claim 20 and therefore include all of the features recited in claim 20. As more fully set forth above, the combination of Loewenstein, Yanagisawa et al., and Suto et al., does not disclose, or even suggest, all of the features recited in claim 20. Mori et al. is not relied upon for disclosing or suggesting the features of claim 20 not disclosed or suggested by the combination of Loewenstein, Yanagisawa et al., and Suto et al. Indeed, Mori et al. does not disclose, or even suggest, the features of claim 20 not disclosed or suggested by the combination of Loewenstein, Yanagisawa et al., and Suto et al.

In view of the foregoing, it is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., Suto et al., and Mori et al. does not render unpatentable claims 23 and 26. Accordingly, withdrawal of the present rejection is respectfully requested.

#### **VII. Rejection of Claim 24 Under 35 U.S.C. § 103(a)**

Claims 23 and 26 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Loewenstein, Yanagisawa et al., Suto et al. and U.S. Patent No. 6,953,557 ("Ikeda et al."). It is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., Suto et al., and Ikeda et al. does not render unpatentable claims 23 and 26 for at least the following reasons.

Claim 24 depends from claim 20 and therefore includes all of the features recited in claim 20. As more fully set forth above, the combination of Loewenstein, Yanagisawa et al., and Suto et al., does not disclose, or even suggest, all of the features recited in claim 20. Ikeda et al. is not relied upon for disclosing or suggesting the features of claim 20 not disclosed or suggested by the combination of Loewenstein, Yanagisawa et al., and Suto et al. Indeed, Ikeda et al. does not disclose, or even suggest, the features of claim 20 not disclosed or suggested by the combination of Loewenstein, Yanagisawa et al., and Suto et al.

In view of the foregoing, it is respectfully submitted that the combination of Loewenstein, Yanagisawa et al., Suto et al., and Ikeda et al. does not render unpatentable claim 24. Accordingly, withdrawal of the present rejection is respectfully requested.

**VIII. Conclusion**

It is therefore respectfully submitted that all of the presently pending claims are allowable. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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